

Blueshift - September, 2013

How We Learn, Part 4 of our interview with Dr. Phil Plait

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Maggie Masetti: Welcome to Blueshift, brought to you from NASA's Goddard Space Flight Center. I'm Maggie Masetti.

This is the last part of our interview with Phil Plait, the so-called "Bad Astronomer." Last time we talked about the value of actually looking up at the sky. Looking up can make you feel small, but it can also help you to realize that you are part of a larger picture. There is also the feeling that you may be familiar with some of what's in the night sky, but there is also so much out there left to discover and to try to understand.

Phil: It's an interesting dichotomy and I'm pretty familiar with the sky. I've been an amateur astronomer my whole life. I go out and I see all those stars and I think, "Wow, I can name a lot of them." But there are ten up there that I can see for every one I can name, if not a hundred. And so it makes you feel like, "wow!" Just to be a small tiny part of this but then the flipside of that is you can look at Betelgeuse and say, "well that's this type of supergiant and we know it's this and we know that it's going to blow up and we know this and that and the other thing." And it's like we know so much about what's going on out there and every day we know a little bit more and sometimes a lot more. And it's this beautiful contrast of being tiny and small and so much and being overwhelmed but also being an integral part of it and understanding it and seeing it for what it is and these two things are hand in glove and I love that.

Sara: Well and it's just very much about knowledge and about understand our place...

Phil: Understanding is the word that I would use.

Sara: Have you ever debunked one of your own misconceptions?

Phil: Yeah, sure! Everybody walks around with things in their head that are wrong and I've even had contradictory ideas in my head. Everybody does. Where I've thought one thing and thought something totally contrary to that at the same time. But those two ideas never came up at the same time. And when they do you go, "Oh... one of these must be wrong." And that happens. It happens in astronomy but it happens more often with me in fields I'm not as familiar with like biology or something like that. Geology especially, I love geology. And again I'm not sure I could come up with a specific example off the top of my head but certainly because I've written about it. I've written on my blog saying, "I always thought this and it turns out I've been wrong this whole time." And I could have known that and that's fantastic because when that happens it's a little embarrassing but far outweighing any personal potential embarrassment is the idea, "Ooo! I know something better now!" And that's kind of the ultimate goal of science. We may not ever know everything but we can always get closer and knowing more is the point.

(Sara: That's a perfect sound-bite. You're good at this, Phil.

Phil: I just make most of this stuff up

Sara: Okay good.)

Phil: It takes strength to do it the first time. It gets easier. And it's not always easier every single time because sometimes these mistakes are little and you go, "Oh! That was wrong." And sometimes it's like, "My entire life has been wrong - I'm living a lie!" And that's really hard to admit do but it doesn't take as much strength as you'd think. And, in fact, once you do it you'll look back and go, "Oh, I'm really glad I did that." And it's not like you're going to look forward to being wrong in the future, but you stop looking at it as an impediment and you start looking at it as a way to help you climb over that next hurdle and learning more.

Sara: Well and I think that's what good educators learn and it's what people who are in a position like yours have to learn or basically you're just arrogant about it. If you can't ever be wrong there's something fundamentally wrong with you.

Phil: To me that's the sin. Making a mistake - an honest mistake - is one thing but then holding it to your chest and not letting go of it, that's the mistake. That's the much bigger mistake. And if you don't make mistakes, if you don't make errors, and then look at them and figure out where you went wrong and learn from it how are you ever going to improve? That's how we learn, by making mistakes, one way we learn.

Sara: What about the fact that people have trouble understanding that science can be wrong and that's alright? And rather see it as science is not reliable and science is not trustworthy because sometimes scientists are wrong?

Phil: The media and in politics - and I know we can't touch on politics too much since NASA is, in fact, a government agency - but there's a lot of times where there's a distrust of science is fed by people who maybe want to make science look bad. I run across this all the time and my take on it is that this is how we learn. Yes, you know what, science maybe once... if you want to make the case that science once thought the Earth was flat... which is bologna, science never thought that. Science doesn't think anything. But the Earth was flat and da da da and all these kind of things... and I say, "but you know, we learned from that." And even with hoaxes, Piltdown Man and that sort of thing... Do you think it was the believers in that thing who fixed it? No, it was the people who looked at it scientifically and said, "hey, this is wrong." That's how we learn and so it's not that science making mistakes is a weakness, in fact, that is science's greatest strength. In a hurricane the tree that can't bend snaps. The one that can bend is the one that survives. And science can bend. There are still people out there that think that the Earth is flat - they're still wrong! But when you look at the scientific evidence there's a lot of reasons to show, to understand, that the Earth is actually a sphere. And then if you really apply science you learn that it's not actually a sphere, it's an oblate spheroid and then it's got all these other terms to it and that. And the more you learn the cooler it is! So if you want to accuse science of being sort of a "flat-Earth" kind of thinking that is completely wrong. And it is the fact that we know that the Earth isn't flat that is the reason that science is so strong.

Maggie: Thanks for listening! We hope you enjoyed this multi-part interview with Phil. I personally find him to be a very dynamic and passionate speaker, and I think those things make him a great spokesperson for the value of science. We hope we've managed to pass a little of his enthusiasm on to you! Be sure to check out our blog at universe.nasa.gov/Blueshift - that's where you can find more information about this podcast, as well as our previous podcasts and blogs. You can also find us on Twitter and Facebook as NASABlueshift (all one word). Tell us what you'd like to hear about there, or through our website feedback form!

I'm Maggie Masetti, bringing the Universe closer to you with Blueshift.

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